Precalculus Name_____ ID: 1

Extra Review 2

Date_____ Period____

Use a graphing calculator to approximate the relative and absolute extrema of each function. Then approximate the intervals where each function is increasing and decreasing.

1) $f(x) = -x^3 + 13x^2 - 56x + 77$

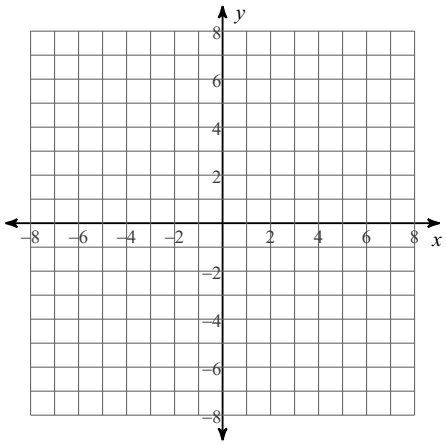
2) $f(x) = x^4 - x^2 - 1$

3) $f(x) = -x^2 + 2x$

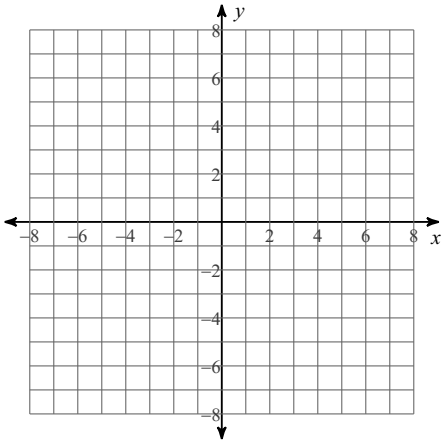
4) $f(x) = \dfrac{3}{x^2 - 16}$

Sketch the graph of each function.

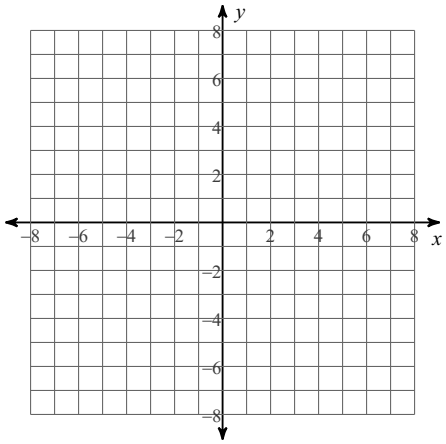
5) $g(x) = \begin{cases} x + 1, & x < -1 \\ -1, & -1 \le x < 4 \\ -3, & x \ge 4 \end{cases}$



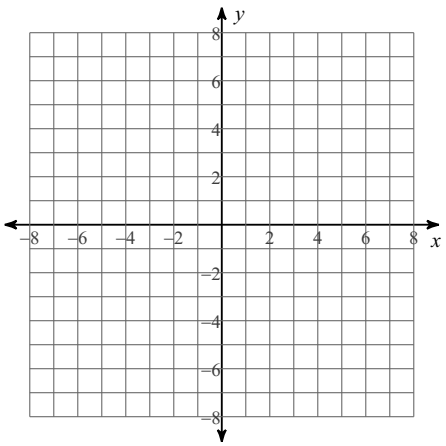
6) $h(x) = \begin{cases} -6, & x < -4 \\ 2^x, & -4 \le x < 1 \\ \dfrac{1}{x} + 2, & x \ge 1 \end{cases}$



7) $w(x) = \begin{cases} -|x|, & x \le -3 \\ |x| - 1, & -3 < x \le 2 \\ (x - 3)^2, & x > 2 \end{cases}$



8) $f(x) = \begin{cases} (x + 2)^2, & x < -2 \\ \dfrac{1}{x + 2}, & x \ge -2 \end{cases}$



Perform the indicated operation.

9) $h(n) = 3n + 3$
$g(n) = n^2 + 3n$
Find $(h \cdot g)(n)$

10) $g(n) = 3n - 1$
$h(n) = -n^3 + 3n$
Find $(g - h)(n)$

11) $f(x) = 2x + 3$
$g(x) = x^3 + 3x$
Find $f(x) - g(x)$

12) $f(x) = 3x - 4$
$g(x) = 2x^3 + x^2$
Find $\left(\frac{f}{g}\right)(x)$

13) $h(t) = 2t$
$g(t) = 3t - 5$
Find $h(4) - g(4)$

14) $f(n) = 3n + 2$
$g(n) = -2n + 4$
Find $(f + g)(10)$

15) $h(x) = 4x - 4$
$g(x) = x^2 + 4x$
Find $h(g(-9))$

16) $g(x) = 2x + 1$
$h(x) = 2x - 2$
Find $g(h(1))$

17) $h(a) = 4a + 1$
$g(a) = a - 5$
Find $2h(2 + a) + 5g(2 + a)$

18) $g(x) = 2x + 4$
$h(x) = x^3 - 4x$
Find $g(-3x) \div h(-3x)$

19) $g(n) = 2n + 1$
$f(n) = 4n + 1$
Find $(2g - f)(-3n)$

20) $g(x) = x^2 - 2x$
$h(x) = -3x - 4$
Find $(g \cdot h)(x + 1)$

Find the inverse of each function.

21) $h(n) = -\frac{3}{n} - 2$

22) $g(x) = -2x^3 + 2$

23) $g(x) = -2x$

24) $f(x) = \frac{2}{5}x + \frac{4}{5}$

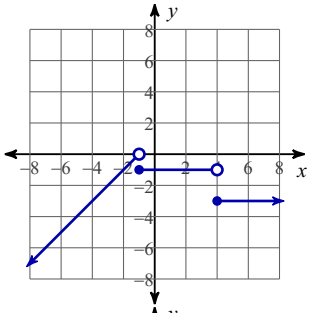
Answers to Extra Review 2 (ID: 1)

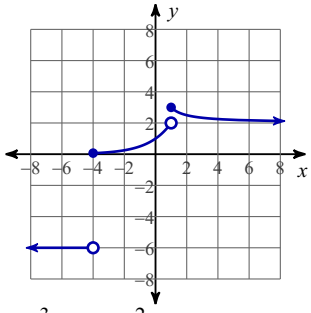
1) Relative minimum: $(4, -3)$
Relative maximum: $(4.7, -2.9)$
Increasing: $(4, 4.7)$ Decreasing: $(-\infty, 4), (4.7, \infty)$

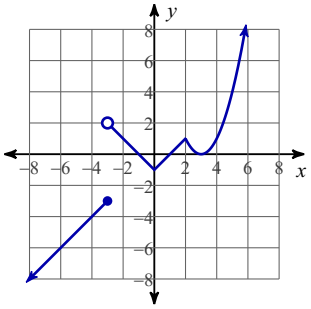
2) Absolute minima: $(-0.7, -1.3), (0.7, -1.3)$
Relative maximum: $(0, -1)$
Increasing: $(-0.7, 0), (0.7, \infty)$ Decreasing: $(-\infty, -0.7), (0, 0.7)$

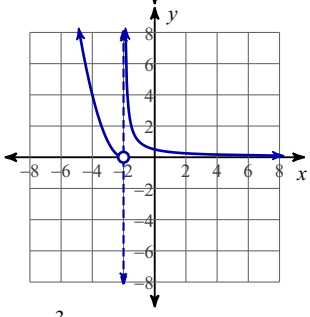
3) No absolute or relative minima.
Absolute maximum: $(1, 1)$
Increasing: $(-\infty, 1)$ Decreasing: $(1, \infty)$

4) No absolute or relative minima.
Relative maximum: $(0, -0.2)$
Increasing: $(-\infty, -4), (-4, 0)$ Decreasing: $(0, 4), (4, \infty)$

5) 

6) 

7) 

8) 

9) $3n^3 + 12n^2 + 9n$

10) $n^3 - 1$

11) $-x^3 - x + 3$

12) $\dfrac{3x - 4}{2x^3 + x^2}$

13) 1

14) 16

15) 176

16) 1

17) $13a + 3$

18) $-\dfrac{2}{-9x^2 - 6x}$

19) 1

20) $-3x^3 - 7x^2 + 3x + 7$

21) $h^{-1}(n) = -\dfrac{3}{n + 2}$

22) $g^{-1}(x) = \sqrt[3]{\dfrac{-x + 2}{2}}$

23) $g^{-1}(x) = -\dfrac{1}{2}x$

24) $f^{-1}(x) = -2 + \dfrac{5}{2}x$